

Amendments to the Claims

1-26. (Cancelled)

27. (New) A communication network, comprising:

a domain name server configured to maintain a first address data structure having a host name field, a private address field, a public address field, and a lease time field, determine if any public addresses in the public address field of the first address data structure have timed-out and update the first address data structure responsive to determining that at least one of the public addresses in the public address field of the first address data structure has timed-out, receive a query from a requesting host for a public address of a private network host, determine if a public address for the private network host has been assigned as indicated by the first address data structure, and transmit a request for the public address of the private network host if the public address of the private network host has not been assigned; and

a network address translator configured to maintain a second address data structure having a host name field, a private address field, a public address field, and a lease time field, receive the request for the public address of the private network host, dynamically assign the public address to the private network host and a time period for the assignment of the public address to the private network host, update the second address data structure based on the public address and time period assignment, transmit a response indicating the public address of the private network host and the time period, determine if any public addresses in the public address field of the second address data structure have timed-out and if at least one of the public addresses in the public address field of the second address data structure has timed-out, then update the second address data structure and transmit a message to the domain name server that the public address of the private network host is no longer valid;

the domain name server further configured to receive the response indicating the public address of the private network host and the time period, update the first address data structure based on the public address and time period assignment, and transmit the public address of the private network host to the requesting host.

28. (New) The communication network of claim 27 wherein the public address comprises an Internet Protocol (IP) address.

29. (New) The communication network of claim 27 wherein the time period indicates a time period in which the public address of the private network host is valid.

30. (New) The communication network of claim 27 wherein the time period specifies a time duration of network inactivity for the public address.

31. (New) The communication network of claim 27 wherein the request to the network address translator is in a Simple Network Management Protocol format.

32. (New) The communication network of claim 27 wherein the domain name server is configured to receive and process management messages to update the first address data structure.

33. (New) The communication network of claim 27 wherein the network address translator is configured to:

determine if a public address has already been assigned to the private network address before dynamically assigning the public address to the private network host; and
transmit the response indicating the public address already assigned to the private network host.

34. (New) The communication network of claim 33 wherein the network address translator is configured to transmit an indication of a time period remaining for which the public address is valid.

35. (New) The communication network of claim 27 wherein the network address translator is configured to determine if a public address is available before dynamically assigning the public address to the private network host.

36. (New) A method of operating a communication network, wherein the communication network includes a domain name server and a network address translator, the method comprising:

in the domain name server,

maintaining a first address data structure having a host name field, a private address field, a public address field, and a lease time field, and determining if any public addresses in the public address field of the first address data structure have timed-out and updating the first address data structure responsive to determining that at least one of the public addresses in the public address field of the first address data structure has timed-out;

receiving a query from a requesting host for a public address of a private network host, determining if a public address for the private network host has been assigned as indicated by the first address data structure, and transmitting a request for the public address of the private network host if the public address of the private network host has not been assigned;

in the network address translator,

maintaining a second address data structure having a host name field, a private address field, a public address field, and a lease time field;

receiving the request for the public address of the private network host, dynamically assigning the public address to the private network host and a time period for the assignment of the public address to the private network host, updating the second address data structure based on the public address and time period assignment, and transmitting a response indicating the public address of the private network host and the time period;

determining if any public addresses in the public address field of the second address data structure have timed-out and if at least one of the public addresses in the public address field of the second address data structure has timed-out, then updating the second address data structure and transmitting a message to the domain name server that the public address of the private network host is no longer valid; and

in the domain name server,

receiving the response indicating the public address of the private network host and the time period, updating the first address data structure based on the public address and time period assignment, and transmitting the public address of the private network host to the requesting host.

37. (New) The method of claim 36 wherein the public address comprises an Internet Protocol (IP) address.

38. (New) The method of claim 36 wherein the time period indicates a time period in which the public address of the private network host is valid.

39. (New) The method of claim 36 wherein the time period specifies a time duration of network inactivity for the public address.

40. (New) The method of claim 36 wherein the request to the network address translator is in a Simple Network Management Protocol format.

41. (New) The method of claim 36 further comprising:

in the domain name server, receiving and processing management messages to update the first address data structure.

42. (New) The method of claim 36 further comprising:

in the network address translator,

determining if a public address has already been assigned to the private network address before dynamically assigning the public address to the private network host; and

transmitting the response indicating the public address already assigned to the private network host.

43. (New) The method of claim 42 further comprising:

in the network address translator, transmitting an indication of a time period remaining for which the public address is valid.

44. (New) The method of claim 36 further comprising:

in the network address translator, determining if a public address is available before dynamically assigning the public address to the private network host.